REMARKS

Claims 1-19 are pending in the present application. Reexamination and reconsideration are requested in light of the accompanying remarks.

The rejection of claims 1-5, 9-11, 13-15, and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over Campanella (U.S. Patent No. 5,900,311) in view of Skogman (U.S. Patent No. 5,522,340) and Parish (U.S. Patent No. 5,843,221) is respectfully traversed. Campanella teaches a vacuum-assisted method of making a polyester composite. The method includes coating the surface of a mold with a gel coat, applying a skin laminate over the partially cured gel coat, applying a fiber reinforcement to the skin laminate, closing the mold, and injecting a one phase matrix precursor while the mold is under vacuum. The one phase composite matrix precursor comprises a polyester, a reactive monomer, and a low-profile additive. Abstract. The skin laminate contains a thermosetting resin, such as vinyl ester, vinyl ester modified epoxy, and vinyl ester modified unsaturated polyester, with a high fiber content, about 25 to about 45% fiber, typically chopped fiber or a continuous strand fiber mat. Col. 5, lines 38-47, and col. 6, lines 14-16.

Skogman describes a vessel with side walls having a first inner wall spaced apart from a second outer wall. The first inner wall and second outer wall are composed of resinous material. There is an intermediate single woven member disposed and bonded between the first inner and second outer walls. See Abstract, and col. 2. lines 15-20. The process of making the composite is described at col. 5, lines 19-58. A gel coat is applied to the mold and cured. A fiberglass reinforced resin skin coat is sprayed onto the cured gel coat, and allowed to cure. After the fiberglass reinforced resin skin coat is cured, an external structural reinforcement layer is made by applying rolls of fiberglass which are wet with liquid polyester resin. After this layer is cured, a bed coat of fiberglass resin is sprayed on the external structural reinforcement layer. While this layer is still wet, the intermediate single woven member is laid onto it and rolled into the bed coat with a handheld roller until it is embedded in the bed coat. The embedded intermediate single woven member is wetted with a liquid resin. A thin fiberglass reinforced resin cap layer is sprayed up on the wet intermediate single woven member and rolled out with a

handheld roller and allowed to cure. An internal structural reinforcement layer is made by applying rolls of fiberglass which are wet with resin, and the layer is then cured.

Skogman cannot properly be combined with Campanella because there is no motivation to combine the references. Skogman uses an open mold process, while Campanella teaches a process in which there are closed mold steps. Campanella teaches away from open mold processes, specifically criticizing them as being unable to provide composites with the strength of his process.

> The hallmark of these composites is their combination of physical strength as measured by one or more standard strength tests for composites and smooth surface profile as compared to the thermosetting polyester composites made from a typical hand lay-up or spray up process. . . .

Abstract. See col. 3, lines 14-20.

> The physical strength of the composites of this invention is much greater than the physical strength of similar composites made from conventional hand lay-up, spray-up, or resin transfer molding techniques. . . .

Col. 1, lines 12-15.

> The hand lay-up and spray-up processes are the most common practices in the manufacture of large and complex parts, such as boat hulls and truck body panels. Continuous or chopped fiber mats are impregnated with and engulfed in a matrix resin, and the resin is cured without additional heat or pressure. The typical fiber reinforcement (e.g., glass fiber) content of a composite made by these techniques is about 20 to 40% by weight, based on the cured weight of the composite. Therefore, the physical strength (as measured by any one of a number of different tests) of these composites is typically not very great and if greater physical strength is desired for a particular application, then a thicker composite is usually required (the physical strength of a composite being a function of the fiber content of the composite and its thickness.)

Col. 2, lines 9-24.

Thus, Campanella teaches away from using open mold processes. Therefore, it cannot be combined with Skogman, which teaches an open mold process.

The examiner further stated that the "references do not disclose the specific composition used to make the skin laminate" and cited Parish's composition for this.

Parish describes a sprayable, high solids, low-volatiles filler composition which is used as a coating on a variety of substrates. The coating is applied to a substrate in a thickness up to 6 mils. The filler composition provides a surface which is immediately suitable for subsequent application of top coats. The filler composition includes a filler/glazing component, a catalyst component, and a second organic solvent component. The filler/glazing component contains vinyl ester or vinyl ester in combination with polyester resin, filler, thixotropic clay, accelerator, and a first organic solvent.

The examiner stated that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use the composition of Parish in combination with the continuous strand fiber mat of Campanella and Skogman as the skin laminate of Campanella et al. since the composition uses a minimum of volatile solvents and can enhance the surface appearance of composites (Col. 3, ll. 20-42) which is desired by Campanella et al. which discloses that the purpose of skin laminates is to improve the surface smoothness of the product (Col. 5, ll. 32-33) and to use this in combination with the strand fiber mat disclosed in Campanella since it might be difficult to evenly apply a composition containing the high fiber content desired by Campanella. (Col. 5, ll. 43-47)"

Campanella and/or Skogman cannot properly be combined with Parish because there is no motivation to combine the references. (Campanella cannot be combined with Skogman for the reasons discussed above.) Campanella teaches high fiber content composites, in excess of 30 wt% and preferably in excess of 40 wt% fiber. Abstract, and col. 3, lines 3-12. Campanella's skin laminate contains 25 to 45% by weight of fiber, with the fiber being in the form of 0.5 to 2 inch chopped fiber or a sheet of continuous strand fiber mat. The thermosetting resins typically used include vinyl esters, vinyl ester modified epoxies, and vinyl ester modified unsaturated polyesters resins. Col. 3, lines 26-30, and col. 5, lines 38-47. Skogman includes a fiberglass reinforced resin skin coat. Col. 5, line 30-33. The fiber reinforcement in the skin laminate helps to provide strength to the molded part. It would defeat Campanella's purpose of providing a high strength

molded part to use Parish's composition as the skin laminate because it does not include fiber reinforcement.

In response, the examiner stated that "Campanella discloses the fibers can be short or can be a continuous strand mat, indicating that they are not part of the composition." This statement is not understood. Campanella clearly teaches that the skin laminate contains fiber reinforcement.

> A skin laminate, typically 10 to 30 mils in thickness, is applied behind the gel coat to improve the hydrolyic stability and surface smoothness of the molded article. The fiber content of the skin laminate typically ranges from 25 to 45% by weight, and the fiber typically is in the form of 0.5 to 2 inch chopped fiber or a sheer [sic] of a continuous strand fiber mat.

Col. 3, lines 24-29.

> Moreover, the thermosetting resins typically used in the preparation of the skin laminate usually exhibit better hydrolytic stability than those used in the preparation of the composite. Examples of these resins include vinyl esters, vinyl ester modified epoxies, and vinyl ester modified unsaturated polyester resins. The typical fiber content of a skin laminate ranges from about 25 to about 45 percent by weight. The fiber used in the skin laminate is typically either about 0.5 to about 2 inch chopped fiber of a sheer [sic] of a continuous strand fiber mat.

Col. 5, lines 38-47. Thus, there is no basis for the examiner's suggestion that the fibers are not part of the skin laminate composition.

The examiner suggests as part of the motivation to use Parish's composition with the strand fiber mat disclosed in Campanella that "it might be difficult to evenly apply a composition containing the high fiber content desired by Campanella." However, Campanella does not teach or suggest that there is any problem evenly applying the high fiber content skin laminate. Nor has the examiner provided any other reference teaching or suggesting this.

Even if Campanella and Parish are properly combinable, the combination does not render the claimed invention obvious. Campanella cannot be combined with Skogman for the reasons discussed above. Campanella does not teach or suggest "applying a layer of fiberglass reinforcement over the cured barrier composition," as claimed. Campanella

does not teach or suggest curing the skin laminate before the fiber reinforcement is applied. See col. 6, lines 5-13.

The examiner stated that "[s]ince the claim does not require the skin laminate to be fully cured, the partially cured skin laminate of Campanella is considered to read on the claims." However, there is no teaching or suggestion that the skin laminate of Campanella is partially cured. Campanella's description of the process does not teach or suggest that the skin laminate is partially cured.

> First, a gel coat is usually applied to the surface of the mold, at least partially cured, and then a skin laminate is applied over the at least partially cured gel coat. These are open mold operations. Then the fiber reinforcement is applied to the skin laminate, the mold is closed, and the matrix precursor injected under vacuum. The precursor is then allowed to cure, with or without a heat supplement, and the part or article is demolded.

Col. 6, lines 6-13. The Office Action states in two places (p. 2 and p. 6) "[t]he reference does not disclose curing the skin laminate prior to applying the fiber reinforcement." Nowhere in Campanella is there any teaching or suggestion that the skin coat is partially cured.

The examiner stated "[r]egarding applicant's argument that Campanella does not disclose curing the skin laminate prior to applying the fiber reinforcement, Skogman shows that this appears to be conventional in the same type of arts as Campanella." However, as discussed above, Skogman cannot be combined with Campanella because they describe different types of processes (open v. closed mold), and because Campanella teaches away from using open mold processes.

Thus, claims 1-5, 9-11, 13-15, and 17-19 would not have been obvious to one of ordinary skill in the art at the time the invention was made over Campanella in view of Skogman and Parish.

The rejection of claims 6-8 under 35 U.S.C. § 103(a) as being unpatentable over Campanella, Skogman, and Parish, and further in view of Haraldsson (U.S. Patent No. 6,558,608) is respectfully traversed. Haraldsson is cited as teaching a vacuum-assisted resin transfer molding process. However, Haraldsson does not remedy the deficiencies of Campanella, Skogman, and Parish. Therefore, claims 6-8 would not have been obvious

to one of ordinary skill in the art at the time the invention was made over Campanella in view of Skogman and Parish and further in view of Haraldsson.

The rejection of claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Campanella, Skogman, and Parish, and further in view of Kia (U.S. Publication 2004/0038059) is respectfully traversed. Kia is cited as teaching the use of hollow glass microspheres as a filler in a barrier layer of a composite. However, Kia does not remedy the deficiencies of Campanella, Skogman, and Parish. Thus, claim 12 would not have been obvious to one of ordinary skill in the art at the time the invention was made over Campanella in view of Skogman and Parish and further in view of Kia.

The rejection of claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Campanella, Skogman, and Comstock (U.S. Patent No. 4,288,571) is respectfully traversed. Comstock discloses a composition which includes an unsaturated polyester, a low profile additive, monomer, peroxide accelerator, fillers and thickening agent. Col. 1, lines 57-64, col. 5, lines 24-35, and col. 6, lines 38-43. The low profile additive is a vinyl ester resin, and it is included to reduce shrinkage. Col. 1, lines 25-48. The composition is molded under pressure. Col. 8, lines 34-42.

Contrary to the examiner's position, it would not have been obvious to use Comstock's composition as a skin laminate in Campanella's process. Comstock's composition is the material which is to be molded into the final parts, such as automobile fenders, dashboards and the like. See col. 1, lines 10-24, and lines 49-56, and col. 6, lines 65-68. There is no teaching or suggestion that Comstock's composition could be used as a layer in another composite. Comstock's composition might be substituted for Campanella's composite, but it would not be used as the skin laminate layer in the molded part.

In addition, even if Comstock's composition could be used as Campanella's skin laminate, it would not render the claimed invention obvious. The claimed process recites "applying a layer of fiberglass reinforcement over the cured barrier composition." However, in Campanella's process, the application and partial curing of the gel coat layer and the application of the skin laminate are open mold processes. See col. 6, lines 5-13. If Comstock's composition was applied over the gel coat layer, it would not be cured

before the layer of fiberglass reinforcement was applied because Comstock's composition requires pressure to cure it.

The examiner stated "[r]egarding applicant's argument that Comstock's material would not be suitable for use as a skin laminate since it is a sheet molding compound, applicant has not shown what characteristics of the composition would require it to be molded under pressure. Additionally, a thin layer of material can cure quickly under different conditions that [sic] a thick slab of material. Applicant has not provided any evidence that the composition of Comstock requires pressure to cure."

Contrary to the examiner's position, Comstock teaches that its compound is cured using pressure.

> The actual molding cycle will, of course, depend on the exact compositions being molded. Suitable molding cycles are conducted at temperatures on the order of about 250°F. to about 350°F. for periods of time ranging from about 0.5 minute to 5 minutes.

Col. 6, line 68 to col. 7, line 5.

> The "premix" composition prepared was then used to mold panels, 14 inches by 18 inches by 1/8 of an inch, in a matched metal mold under the following mold cycle:
>
> | | |
> |---|---|
> | *Pressure* | *500 psig* |
> | Temperature | 330 °F. |
> | Time of Molding Cycle | 2-3 minutes |

Col. 8, lines 33-42.

In addition, Comstock identifies its material as usable as a sheet molding compound. Col. 6, lines 38-43. Comstock includes low profile additives, which are used in sheet molding compounds to reduce shrinkage of the composition. Col. 1, lines 25-40, col. 4, lines 23-57, col. 5, lines 11-23, Example 1, Table 1, and claim 1. Sheet molding compounds are known to require pressure for curing. See e.g., Gynn, U.S. Patent No. 5,521,232, col. 4, line 50 to col. 5, line 58.

Thus, Comstock specifically teaches that pressure is required to cure its material. Therefore, the examiner's proposed combination of using Comstock's composition as the

skin laminate in Campanella's process would not meet the claim limitation "applying a layer of fiberglass reinforcement over the cured barrier composition." Comstock's material would not be cured because the mold is open at that point in Campanella's process.

Therefore, claim 16 would not have been obvious to one of ordinary skill in the art at the time the invention was made over Campanella and Skogman in view of Comstock.

CONCLUSION

Applicants respectfully submit that, in view of the above remarks, the application is now in condition for allowance. Applicants respectfully request that claims 1-19 be passed to allowance.

If the Examiner has any questions or comments regarding the present application, he is invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,
DINSMORE & SHOHL LLP

By Patricia L. Prior
Patricia L. Prior
Registration No. 33,758

One Dayton Centre
One South Main Street, Suite 1300
Dayton, Ohio 45402-2023
Telephone: (937) 449-6400
Facsimile: (937) 449-6405

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